

Amendments to the Claims

Claim 1 (currently amended) An electro-mechanical battery, comprising:

a housing;

a central core fixedly disposed in said housing, said central core having an internal raceway structure thereon;

a composite rotor enclosed in said housing around said central core, said composite rotor configured to spin about its vertical axis in said housing, said composite rotor having a plurality of closely spaced closed-circuit embedded conductive coils, said embedded conductive coils wrapped around a first composite core, said first composite core comprising carbon fiber filaments bound in an epoxy matrix; and

one or more set of permanent magnet arrays on said internal raceway and disposed between said composite rotor and said central core;

~~_____ a power input for storing a quantity of electrical power to said electro-mechanical battery; and~~

~~_____ a power output for retrieving at least a portion of said quantity of electrical power from said electro-mechanical battery.~~

Claim 2 (cancelled)

Claim 3 (cancelled)

Claim 4 (currently amended): The electro-mechanical battery of claim 3 1, wherein said composite rotor further comprises a second composite core outwardly located from said first composite core and a plurality of strands of composite filaments wrapped around said first composite core and said second composite core, said second composite core comprising carbon fiber filaments bound in an epoxy matrix.

RESPONSE/AMENDMENT

Appl. # 09/848,789

1 Claim 5 (original): The electro-mechanical battery of claim 4, wherein said plurality of strands of
2 composite filaments comprises a first carbon filament layer and a second carbon filament layer, said
3 first carbon filament layer wrapped around said first composite core and said second composite core
4 in a first continuous filament spiral-wound pattern.

5
6 Claim 6 (original): The electro-mechanical battery of claim 5, wherein said second carbon filament
7 layer is wrapped around said first carbon filament layer in a second continuous filament spiral-wound
8 pattern, said second continuous filament spiral-wound pattern applied in a counter-rotating direction to
9 said first continuous filament spiral-wound pattern.

10
11 Claim 7 (original): The electro-mechanical battery of claim 6 further comprising a third carbon
12 filament layer wrapped around said second carbon filament layer, said third carbon filament layer
13 wrapped around said second carbon filament layer in sequential planes radial to the vertical axis of
14 said rotor.

15
16 Claim 8 (original): The electro-mechanical battery of claim 5, wherein said second carbon filament
17 layer is wrapped around said first carbon filament layer in a pattern comprised of sequential planes
18 radial to the vertical axis of said rotor.

19
20 Claim 9 (original): The electro-mechanical battery of claim 1, wherein said one or more sets of
21 permanent magnet arrays comprises a first ring of magnets forming an upper axial magnet array, a
22 second ring of magnets forming a central radial magnet array and a third ring of magnets forming a
23 lower axial magnet array.

24
25 Claim 10 (original): The electro-mechanical battery of claim 9, wherein each of said sets of
26 permanent magnet arrays is configured into a Halbach Array.

1 Claim 11 (original): The electro-mechanical battery of claim 1, wherein each of said sets of
2 permanent magnet arrays is configured into a Halbach Array.

3
4 Claim 12 (original): The electro-mechanical battery of claim 1, wherein said composite rotor has a
5 substantially teardrop-shaped cross-section.

6
7 Claim 13 (currently amended): The electro-mechanical battery of claim 1, wherein said composite
8 rotor has an outside diameter to inside diameter ratio of approximately 2 to 1.

9
10 Claim 14 (original): The electro-mechanical battery of claim 1 further comprising a conductive coil
11 disposed between said composite rotor and said one or more sets of permanent magnet arrays.

12
13 Claim 15 (original): The electro-mechanical battery of claim 14 further comprising an interface hub
14 interconnecting said conductive coil to said composite rotor.

15
16 Claim 16 (original): The electro-mechanical battery of claim 1, wherein said housing is evacuated
17 prior to use of said electro-mechanical battery.

18
19 Claim 17 (currently amended): An electro-mechanical battery, comprising:

20 a mounting structure;

21 a central core disposed on said mounting structure, said core having an internal
22 raceway structure thereon;

23 a composite rotor disposed around said central core, said rotor configured to spin about
24 its vertical axis around said central core, said composite rotor having a plurality of closely spaced
25 closed-circuit embedded conductive coils, said embedded conductive coils wrapped around a first

1 composite core, said first composite core comprising carbon fiber filaments bound in an epoxy
2 matrix; and

3 one or more set of permanent magnet arrays on said internal raceway and disposed
4 between said composite rotor and said central core;

5 ~~a power input for storing a quantity of electrical power to said electro-mechanical~~
6 ~~battery; and~~

7 ~~_____ a power output for retrieving at least a portion of said quantity of electrical power from~~
8 ~~said electro-mechanical battery.~~

9
10 Claim 18 (cancelled)

11
12 Claim 19 (cancelled)

13
14 Claim 20 (currently amended) The electro-mechanical battery of claim ~~19~~ 17, wherein said composite
15 rotor further comprises a second composite core outwardly located from said first composite core and
16 a plurality of strands of composite filaments wrapped around said first composite core and said second
17 composite core, said second composite core comprising carbon fiber filaments bound in an epoxy
18 matrix.

19
20 Claim 21 (original) The electro-mechanical battery of claim 20, wherein said plurality of strands of
21 composite filaments comprises a first carbon filament layer and a second carbon filament layer, said
22 first carbon filament layer wrapped around said first composite core and said second composite core
23 in a first continuous filament spiral-wound pattern.

1 Claim 22 (original) The electro-mechanical battery of claim 21, wherein said second carbon filament
2 layer is wrapped around said first carbon filament layer in a second continuous filament spiral-wound
3 pattern, said second continuous filament spiral-wound pattern applied in a counter-rotating direction to
4 said first continuous filament spiral-wound pattern.

5
6 Claim 23 (original) The electro-mechanical battery of claim 22 further comprising a third carbon
7 filament layer wrapped around said second carbon filament layer, said third carbon filament layer
8 wrapped around said second carbon filament layer in sequential planes radial to the vertical axis of
9 said rotor.

10
11 Claim 24 (original) The electro-mechanical battery of claim 17, wherein said one or more sets of
12 permanent magnet arrays comprises a first ring of magnets forming an upper axial magnet array, a
13 second ring of magnets forming a central radial magnet array and a third ring of magnets forming a
14 lower axial magnet array.

15
16 Claim 25 (original) The electro-mechanical battery of claim 24, wherein each of said sets of
17 permanent magnet arrays is configured into a Halbach Array.

18
19 Claim 26 (original) The electro-mechanical battery of claim 17, wherein said composite rotor has a
20 substantially teardrop-shaped cross-section.

21
22 Claim 27 (original) The electro-mechanical battery of claim 17, wherein said rotor has an outside
23 diameter to inside diameter ratio of approximately 2 to 1.

24
25 Claims 28-47 (cancelled)

1 Claim 48 (new) : An electro-mechanical battery, comprising:

2 a housing;

3 a central core fixedly disposed in said housing, said central core having an internal
4 raceway structure thereon;

5 a composite rotor enclosed in said housing around said central core, said composite
6 rotor configured to spin about its vertical axis in said housing, said composite rotor having a first
7 composite core and a second composite core, each of said first composite core and said second
8 composite core comprising carbon fiber filaments bound in an epoxy matrix, said second composite
9 core outwardly located from said first composite core;

10 a plurality of closely spaced closed-circuit embedded conductive coils wrapped around
11 said first composite core;

12 a plurality of strands of composite filaments wrapped around said first composite core
13 and said second composite core, said plurality of strands of composite filaments comprising a first
14 carbon filament layer and a second carbon filament layer, said first carbon filament layer wrapped
15 around said first composite core and said second composite core in a first continuous filament spiral-
16 wound pattern, said second carbon filament layer is wrapped around said first carbon filament layer in
17 a pattern comprised of sequential planes radial to the vertical axis of said rotor; and

18 one or more set of permanent magnet arrays on said internal raceway and disposed
19 between said composite rotor and said central core.

20
21 Claim 49 (new) : The electro-mechanical battery of claim 48, wherein said one or more sets of
22 permanent magnet arrays comprises a first ring of magnets forming an upper axial magnet array, a
23 second ring of magnets forming a central radial magnet array and a third ring of magnets forming a
24 lower axial magnet array.

1 Claim 50 (new) : The electro-mechanical battery of claim 49, wherein each of said sets of permanent
2 magnet arrays is configured into a Halbach Array.

3
4 Claim 51 (new) : The electro-mechanical battery of claim 48, wherein each of said sets of permanent
5 magnet arrays is configured into a Halbach Array.

6
7 Claim 52 (new) : The electro-mechanical battery of claim 48, wherein said composite rotor has a
8 substantially teardrop-shaped cross-section.

9
10 Claim 53 (new) : The electro-mechanical battery of claim 48, wherein said rotor has an outside
11 diameter to inside diameter ratio of approximately 2 to 1.

12
13 Claim 54 (new) : The electro-mechanical battery of claim 48 further comprising a conductive coil
14 disposed between said composite rotor and said one or more sets of permanent magnet arrays.

15
16 Claim 55 (new) : The electro-mechanical battery of claim 54 further comprising an interface hub
17 interconnecting said conductive coil to said composite rotor.

18
19 Claim 56 (new) : The electro-mechanical battery of claim 48, wherein said housing is evacuated prior
20 to use of said electro-mechanical battery.

21
22 Claim 57 (new) : An electro-mechanical battery, comprising:

23 a housing;

24 a central core fixedly disposed in said housing, said central core having an internal
25 raceway structure thereon;

1 a composite rotor enclosed in said housing around said central core, said composite
2 rotor configured to spin about its vertical axis in said housing, said composite rotor configured in a
3 substantially teardrop-shaped cross-section; and

4 one or more set of permanent magnet arrays on said internal raceway and disposed
5 between said composite rotor and said central core.

6
7 Claim 58 (new) : The electro-mechanical battery of claim 57, wherein said composite rotor further
8 comprises a second composite core outwardly located from said first composite core and a plurality of
9 strands of composite filaments wrapped around said first composite core and said second composite
10 core, said second composite core comprising carbon fiber filaments bound in an epoxy matrix.

11
12 Claim 59 (new) : The electro-mechanical battery of claim 58, wherein said plurality of strands of
13 composite filaments comprises a first carbon filament layer and a second carbon filament layer, said
14 first carbon filament layer wrapped around said first composite core and said second composite core
15 in a first continuous filament spiral-wound pattern.

16
17 Claim 60 (new) : The electro-mechanical battery of claim 59, wherein said second carbon filament
18 layer is wrapped around said first carbon filament layer in a second continuous filament spiral-wound
19 pattern, said second continuous filament spiral-wound pattern applied in a counter-rotating direction to
20 said first continuous filament spiral-wound pattern.

21
22 Claim 61 (new) : The electro-mechanical battery of claim 60 further comprising a third carbon
23 filament layer wrapped around said second carbon filament layer, said third carbon filament layer
24 wrapped around said second carbon filament layer in sequential planes radial to the vertical axis of
25 said rotor.

1 Claim 62 (new) : The electro-mechanical battery of claim 59, wherein said second carbon filament
2 layer is wrapped around said first carbon filament layer in a pattern comprised of sequential planes
3 radial to the vertical axis of said rotor.

4
5 Claim 63 (new) : The electro-mechanical battery of claim 57, wherein said one or more sets of
6 permanent magnet arrays comprises a first ring of magnets forming an upper axial magnet array, a
7 second ring of magnets forming a central radial magnet array and a third ring of magnets forming a
8 lower axial magnet array.

9
10 Claim 64 (new) : The electro-mechanical battery of claim 63, wherein each of said sets of permanent
11 magnet arrays is configured into a Halbach Array.

12
13 Claim 65 (new) : The electro-mechanical battery of claim 57, wherein each of said sets of permanent
14 magnet arrays is configured into a Halbach Array.

15
16 Claim 66 (new) : The electro-mechanical battery of claim 57, wherein said rotor has an outside
17 diameter to inside diameter ratio of approximately 2 to 1.

18
19 Claim 67 (new) : The electro-mechanical battery of claim 57 further comprising a conductive coil
20 disposed between said composite rotor and said one or more sets of permanent magnet arrays.

21
22 Claim 68 (new) : The electro-mechanical battery of claim 67 further comprising an interface hub
23 interconnecting said conductive coil to said composite rotor.

24
25 Claim 69 (new) : The electro-mechanical battery of claim 57, wherein said housing is evacuated prior
26 to use of said electro-mechanical battery.